

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



RHEUMATOLOGY



Combating Malnutrition in patients with Scleroderma



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Agenda



■ Causes of Malnutrition in Scleroderma

■ Tracing Malnutrition

■ How can Nutrition Help

■ Nutrition Tips in Scleroderma

■ Nutrients of potential Benefits

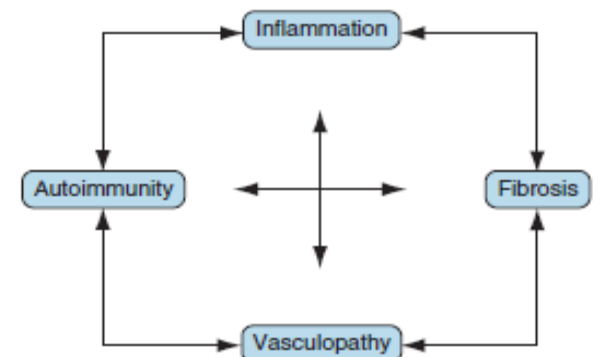


SCLERODERMA



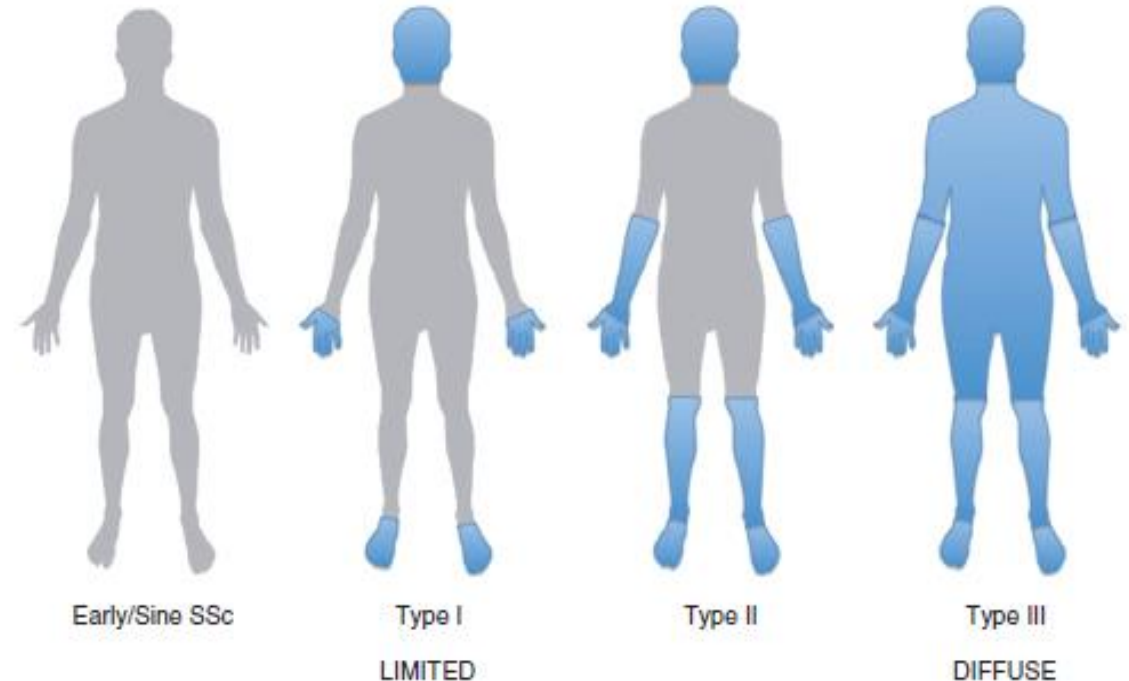
■ SSc is a chronic **Autoimmune Multisystem** connective tissue disease affecting **Skin & Internal organs**

■ The disease hallmarks are: **Inflammation, Functional & Structural alterations** in small blood vessels, & widespread interstitial and vascular **Fibrosis** affecting the skin and internal organs.



SCLERODERMA

■ SSc shows clinical heterogeneity with **subsets** that vary in the degree of disease expression, **organ involvement** & ultimate prognosis.



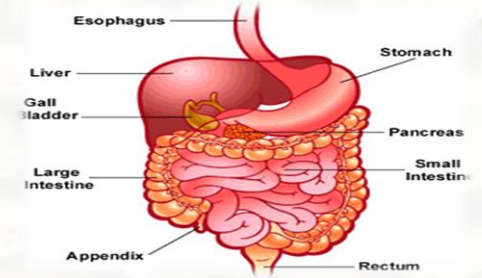
SCLERODERMA

Multiple Organs are affected e.g.:

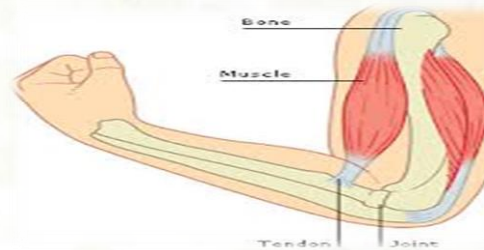
 Skin



 Gastrointestinal



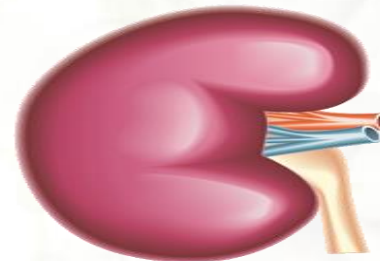
 Musculoskeletal



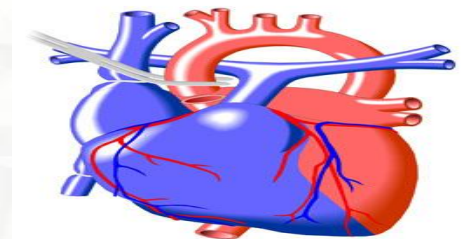
 Pulmonary



 Renal

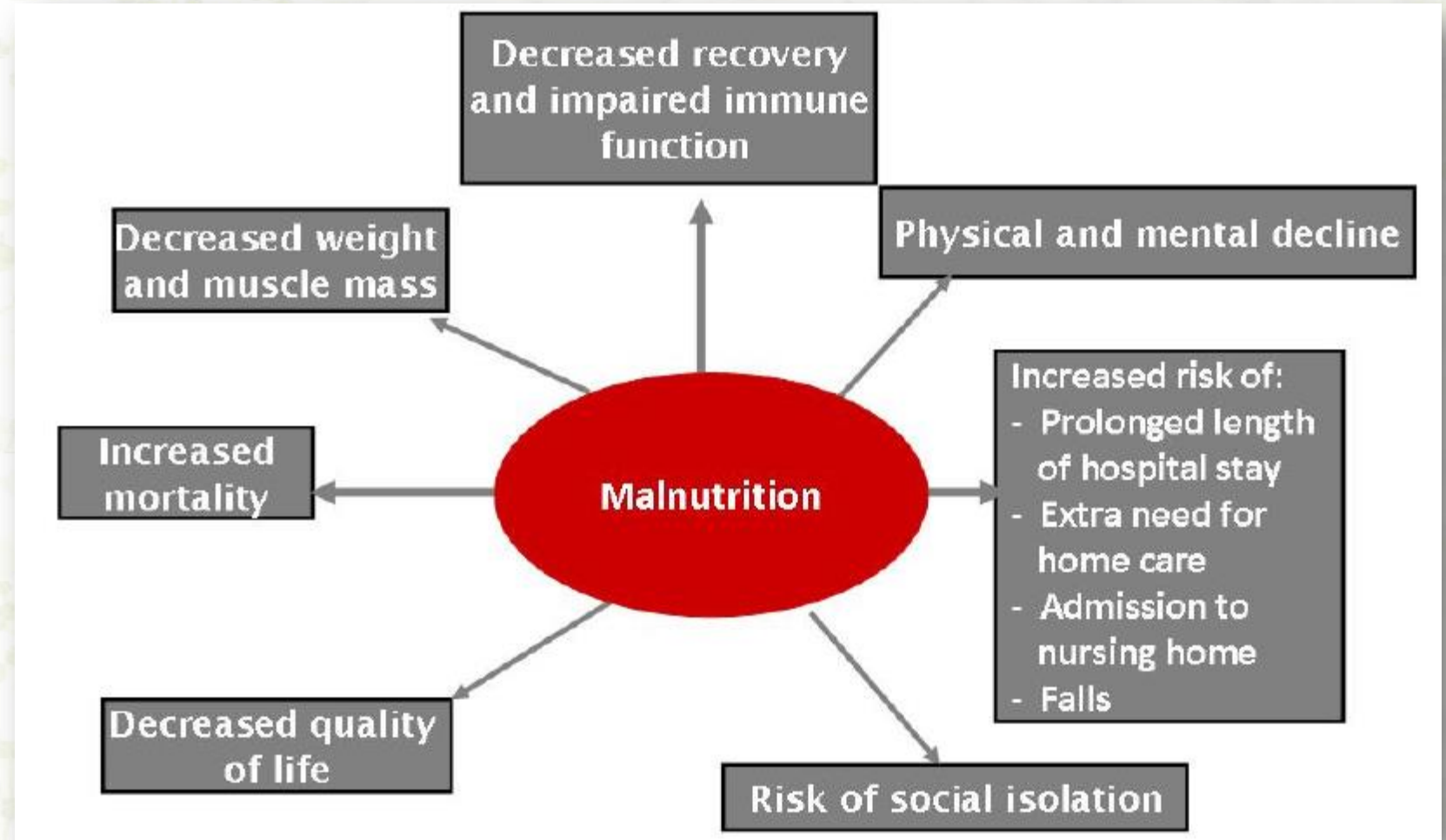


 Cardiac



Malnutrition

 Malnutrition is a burden



Malnutrition

■ Malnutrition is a common complication in SSc It is associated with more aggressive disease progression & higher mortality

- CSRG task force study showed that about 30% of patients with SS had moderate or high risk for Malnutrition
- Malnutrition & GIT disorders are the leading cause of death in 5%–10% of patients with SSc
- Malnutrition related deaths have fallen, from 12% to up to 4% of all deaths (1972-1977/ 1997- 2001)

- Baron et al. / J Rheumatol 2009
- Forbes & Marie. / Rheumatology 2008
- Harrison et al. / Rheumatology 2012

Malnutrition

malnutrition
matters

❑ Patients with SSc suffer from Multi factorial Burden

- Diseases Eitopathogenesis
- Manifestations & Comorbidities
- Treatment Protocols



Tracing Malnutrition



■ **Three main factors can contribute at the same time:**

- 🍎 Decreased intake
- 🍎 Increased energy expenditure
- 🍎 Reduced nutrients availability/use

■ Cases with a significant **GIT** involvement are more likely to result in nutritional status deterioration

■ **Renal & other organs** affection requires special MNT

Tracing Malnutrition

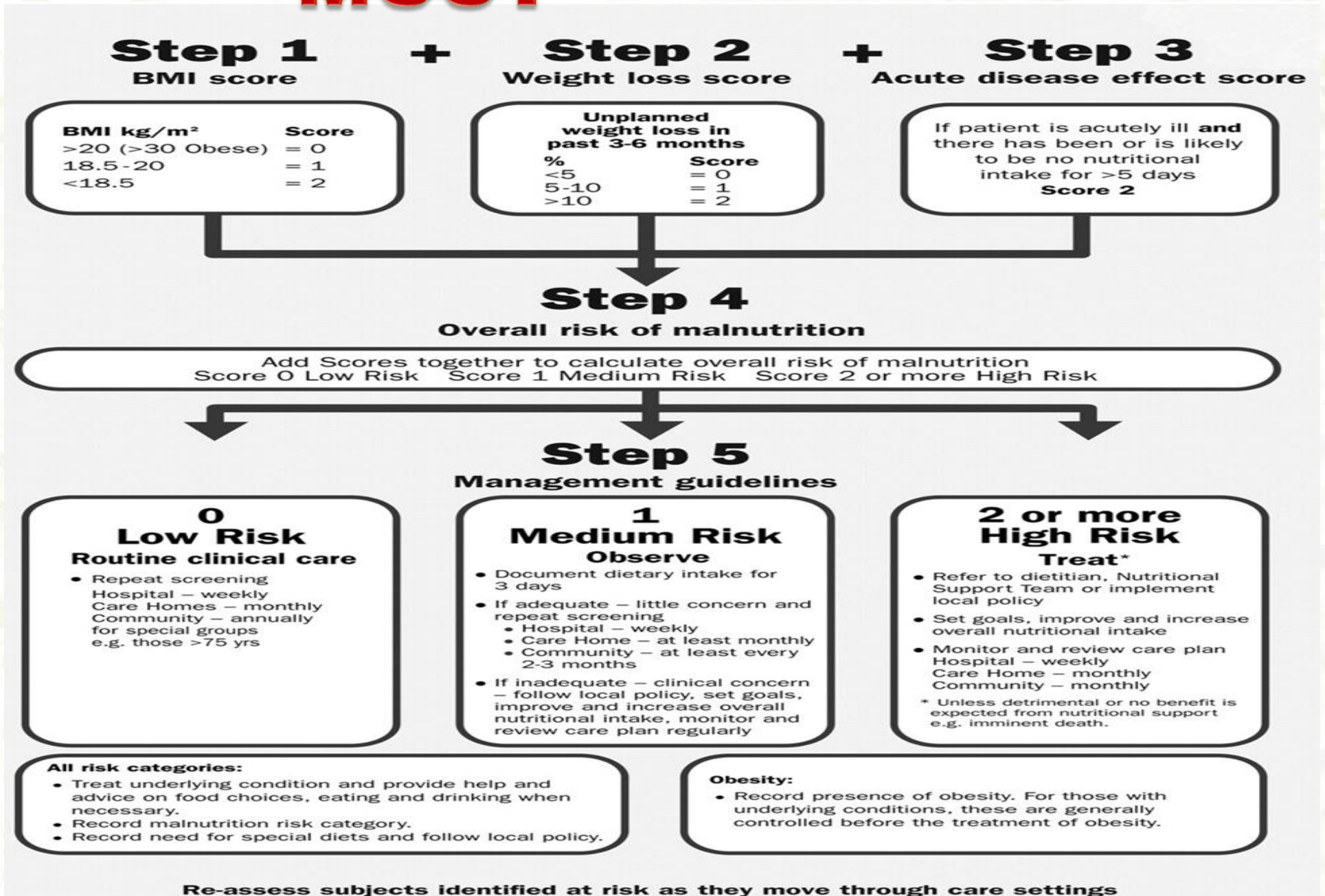


- 🍎 **Early Detection Of Malnutrition**
- 🍎 **Effective Intervention**
- 🍎 **Tailored Individualized Needs**

Screening is especially important



MUST



Questionnaire Used by the Canadian Scleroderma Agency Research Group.

1. I have (or had) a lack of appetite almost every day	Yes	No
2. I have (or had) difficulty swallowing; food or liquid sometimes sticks in my chest when I swallow	Yes	No
3. I have (or had) food or a sour taste returning to my nose and mouth	Yes	No
4. I wake up (or have done so) with a breathless sensation at night	Yes	No
5. I have (or had) a burning sensation in my stomach or lower chest that ascends to my throat almost every day	Yes	No
6. I have (or had) a sensation of fullness shortly after starting to eat on most days	Yes	No
7. I have (or had) visible abdominal swelling or the sensation of abdominal swelling (making me loosen my clothes) almost every day	Yes	No
8. I have (or had) nausea and/or vomiting almost every day	Yes	No
9. I have (or had) constipation almost every day	Yes	No
10. I have (or had) diarrhea almost every day	Yes	No
11. I need (or have needed) antibiotics to control diarrhea	Yes	No
12. I have (or had) greasy, foul smelling stools	Yes	No
13. I have (or had) fecal incontinence (soiling my clothing)	Yes	No
14. I need (or have needed) intravenous feeding	Yes	No

Scored Patient-Generated Subjective Global Assessment (PG-SGA)

Worksheet 1 - Scoring Weight (Wt) Loss

To determine score, use 1 month weight data if available. Use 6 month data only if there is no 1 month weight data. Use points below to score weight change and add one extra point if patient has lost weight during the past 2 weeks. Enter total point

Wt loss in 1 month	Points	Wt loss in 6 months
10% or greater	4	20% or greater
5-9.9%	3	10-19.9%
3-4.9%	2	6-9.9%
2-2.9%	1	2-5.9%
0-1.9%	0	0-1.9%

Numerical score from Worksheet 1

Additive Score of the Boxes 1-4 (See Side 1) A

5. Worksheet 2 - Disease and its relation to nutritional requirements

All relevant diagnoses (specify) _____
Primary disease stage (circle if known or appropriate) I II III IV Other _____

One point each:

- ☐ Cancer ☐ AIDS ☐ Pulmonary or cardiac cachexia ☐ Presence of decubitus, open wound, or fistula
☐ Presence of trauma ☐ Age greater than 65 years ☐ Chronic renal insufficiency

Numerical score from Worksheet 2 B

6. Work Sheet 3 - Metabolic Demand

Score for metabolic stress is determined by a number of variables known to increase protein & calorie needs. The score is additive so that a patient who has a fever of > 102 degrees (3 points) and is on 10 mg of prednisone chronically (2 points) would have an additive score for this section of 5 points

Stress	none (0)	low (1)	moderate (2)	high (3)
Fever	no fever	>99 and <101	>101 and <102	>102
Fever duration	no fever	<72 hrs	72 hrs	> 72 hrs
Corticosteroids	no corticosteroids	low dose	moderate dose	high dose steroid
		(<10mg prednisone equivalents/day)	(>10 and <30mg prednisone equivalents/day)	(> 30mg prednisone equivalents/day)

Fever: Score fever intensity or duration, whichever is greater. (99°F = 37.2°C 101°F = 38.3°C and 102°F = 38.9°C)

Numerical score from worksheet 3 C

Even short term use of corticosteroids can adversely impact protein status and muscle mass

See www.pt-global.org for prednisone equivalents chart and metric and additional language version (as available)

7. Worksheet 4 - Physical Exam

Physical exam includes a subjective evaluation of 3 aspects of body composition: fat, muscle, & fluid status. Since this is subjective, each aspect of the exam is rated for degree of deficit. Muscle deficit impacts point score more than fat deficit. Definition of categories: 0 = no deficit, 1+ = mild deficit, 2+ = moderate, 3+ = severe

Muscle Status:

clavicles (pectoralis & deltoids)	0	1+	2+	3+
interosseous muscles	0	1+	2+	3+
thigh (quadriceps)	0	1+	2+	3+
Global muscle status rating	0	1+	2+	3+

Fluid Status:

These are examples of areas that can/should be considered in determining loss/deficit (or excess fluid). RELAX... One does NOT have to assess all of these to have a global sense for loss or deficit of muscle or fat. Remember the maximum point score for physical exam is only 3 points and you are not likely to be off by more than 1 point...

0	1+	2+	3+
0	1+	2+	3+

Numerical score from Worksheet 4 D

orbital fat pads	0	1+	2+	3+
triceps skin fold	0	1+	2+	3+
Global fat deficit rating	0	1+	2	3+

Total PG-SGA score
(Total numerical score of A+B+C+D above)
(See triage recommendations below)

Global PG-SGA rating (A, B, or C) =

Clinician Signature _____ RD RN PA MD DO Other _____

Date _____

Worksheet 5 - PG-SGA Global Assessment Categories

Category	Stage A	Stage B	Stage C
Weight	Well nourished No wt loss OR Recent wt gain	Moderately malnourished <2% wt loss in 1 month (or 10% in 6 mos) OR Progressive wt loss	Severely malnourished > 2% wt loss in 1 month (or >10% in 6 mos) OR Progressive wt loss
Nutrient intake	No deficit OR Significant recent improvement	Definite decrease in intake	Severe deficit in intake
Nutrition Impact Symptoms	None OR Significant recent improvement allowing adequate intake	Present of nutrition impact symptoms (PG-SGA Box 3)	Present of nutrition impact symptoms (PG-SGA Box 3)
Functioning	No deficit OR Recent improvement	Moderate functional deficit OR Recent deterioration	Severe functional deficit OR most significant deterioration
Physical Exam	No deficit OR Chronic deficit but tissue recent improvement noted on palpation	Evidence of mild to moderate loss of muscle mass / SQ fat / tissue	Obvious signs of malnutrition (e.g., severe loss muscle, SQ possibly edematous)

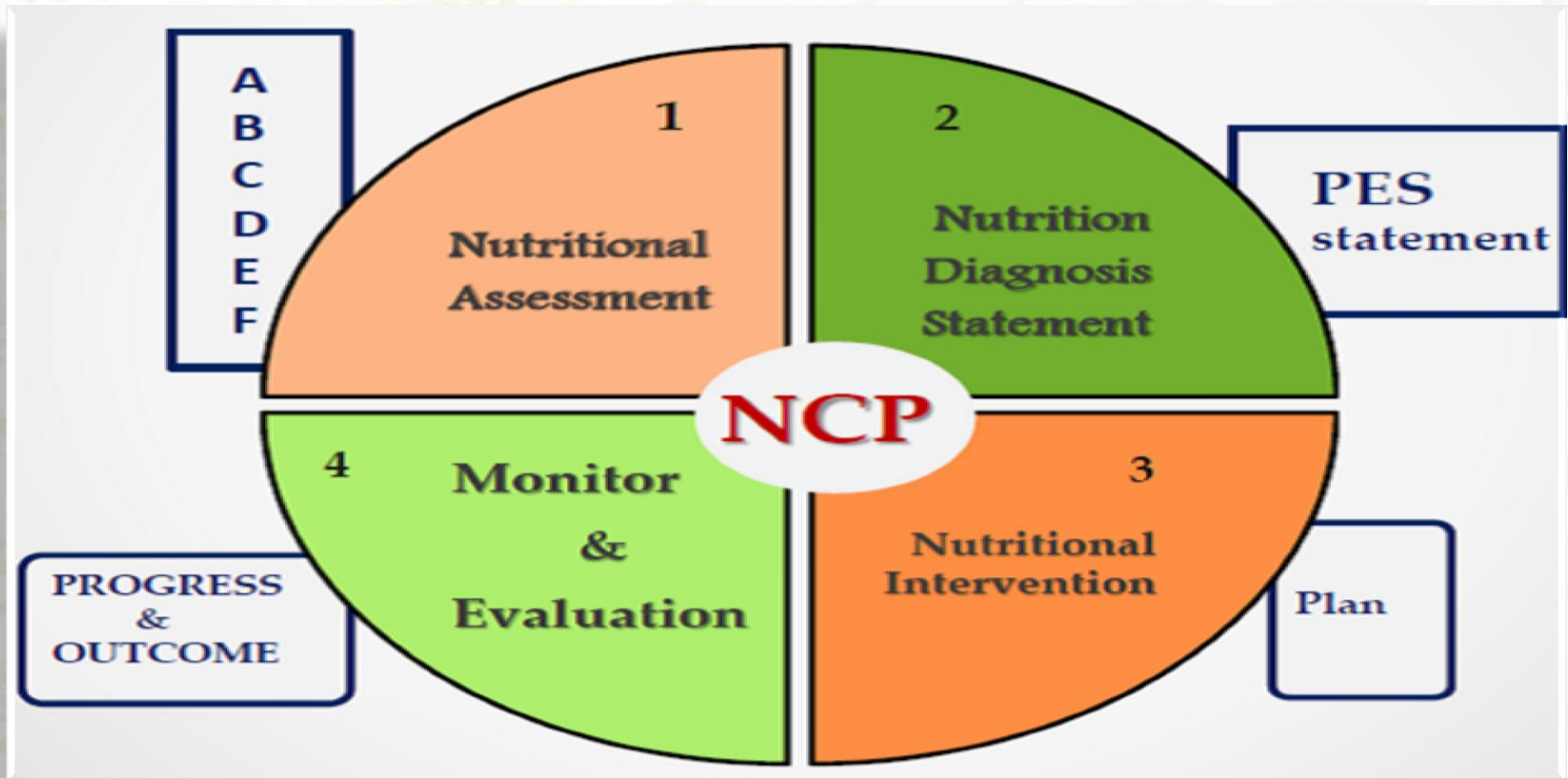
Nutritional Triage Recommendations: Additive score is used to define specific nutritional interventions including patient & family education, symptom management including pharmacologic intervention, and appropriate nutrient intervention (food, nutritional supplements, enteral, or parenteral triage).

First line nutrition intervention includes optimal symptom management.

Triage based on PG-SGA point score

- 0-1 No intervention required at this time. Re-assessment on routine and regular basis during treatment.
2-3 Patient & family education by dietitian, nurse, or other clinician with pharmacologic intervention as indicated by symptom survey (Box 3) and lab values as appropriate.
4-8 Requires intervention by dietitian, in conjunction with nurse or physician as indicated by symptoms (Box 3).
≥9 Indicates a critical need for improved symptom management and/or nutrient intervention options.

Nutrition Care Process (NCP)



Laboratory parameters

The basic analytical determinations established by the U.S. expert panel include:

- 🧑‍🔬 Blood count
- 🧑‍🔬 Hemoglobin
- 🧑‍🔬 Vitamin A,
- 🧑‍🔬 Folic acid
- 🧑‍🔬 Ferritin
- 🧑‍🔬 Vitamin B12.
- 🧑‍🔬 Vitamin D levels ..!!!

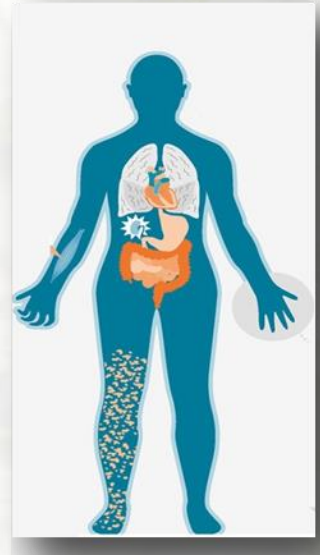


Presentations

■ GIT manifestations affect > 90% of people with this disease, symptoms can be severe

■ Affecting motility, digestion, absorption & excretion
(Esophageal dysfunction , GERD, dysphagia, vomiting, regurgitation, esophagitis or stricture.. etc)

■ Small intestine (bacterial overgrowth & mal-absorption).



Presentations

- Functional derangements (e.g. oral aperture or disability)
- Renal Crisis & other organs affection
- Many other factors that alter daily function need to be addressed (pain, musculoskeletal disuse, co- morbid conditions & emotional aspects)

■ **It is not surprising that SSc is associated with profound morbidity, particularly compromises in nutrition status**

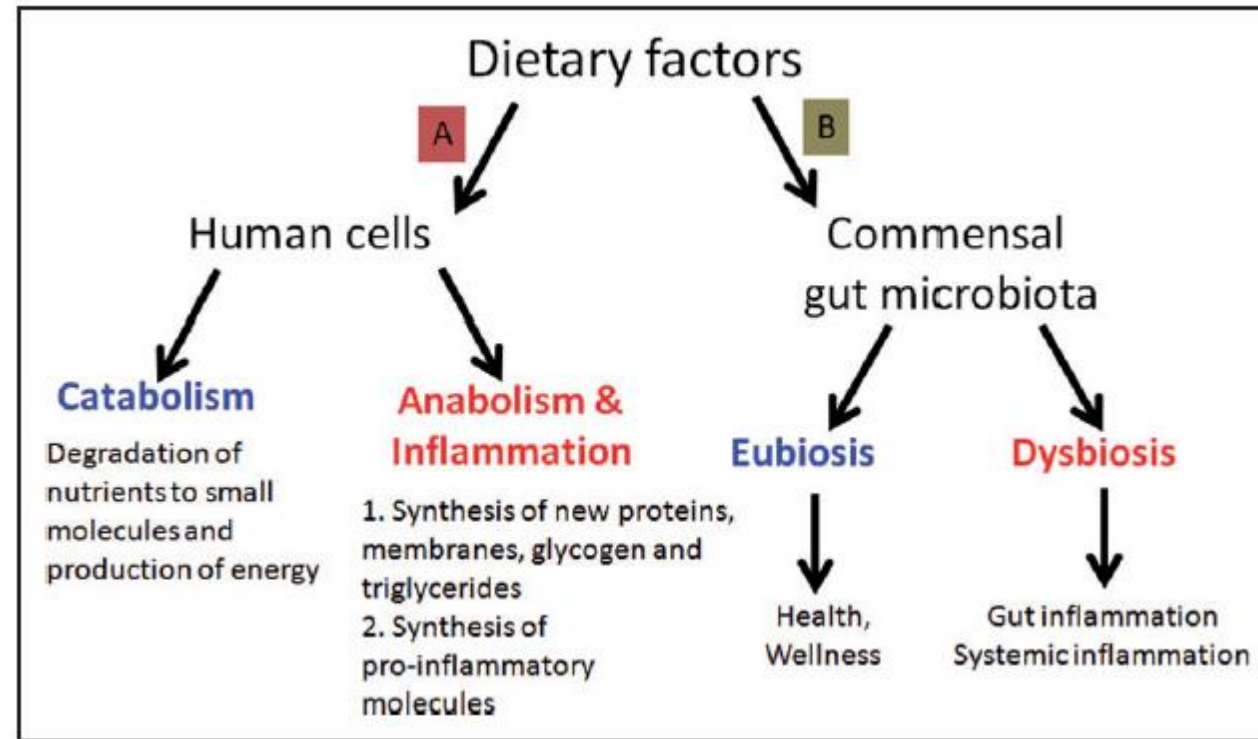
Potential effect of Food & Nutrients



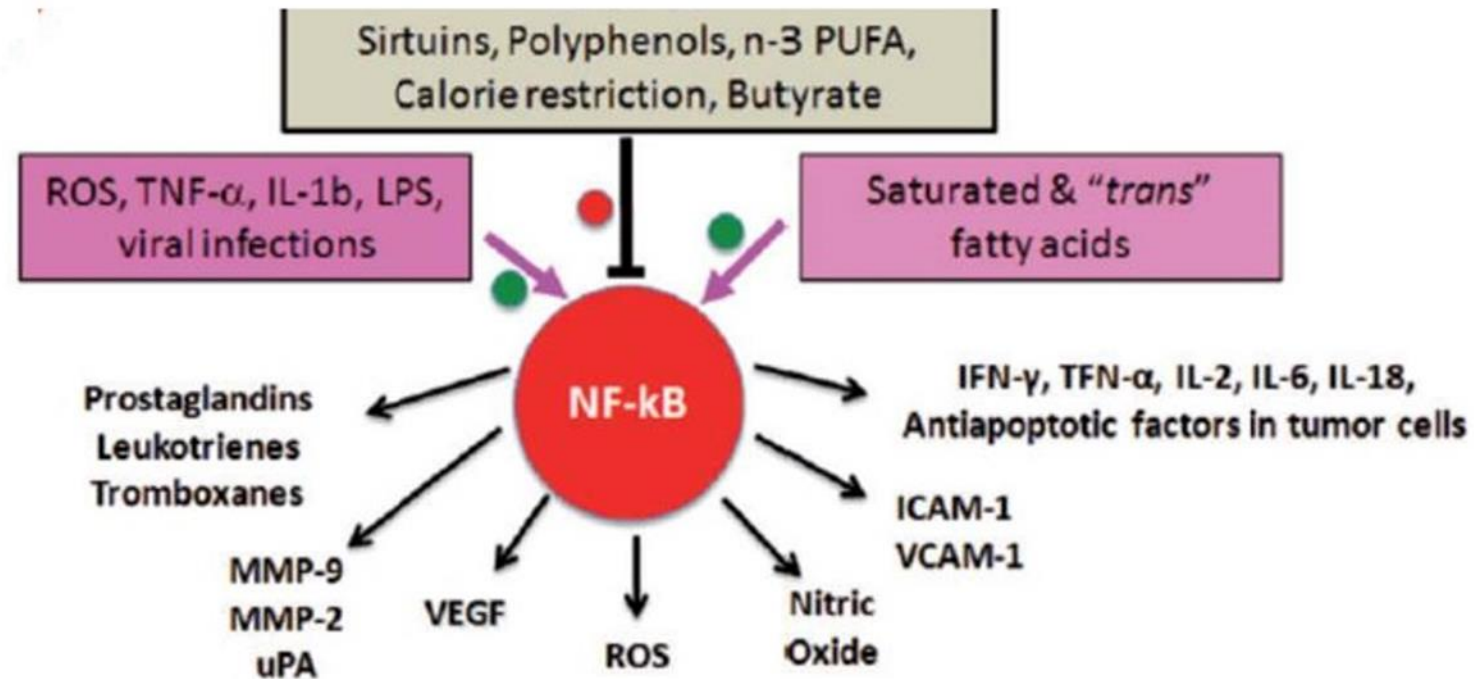
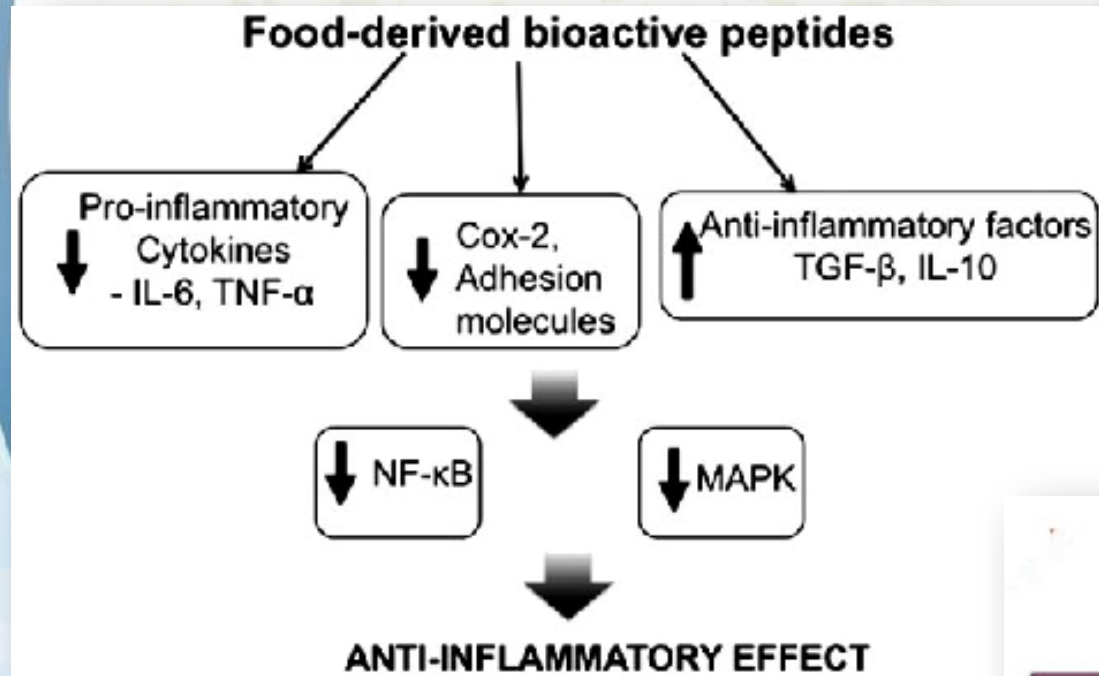
You are
what you **Do**
with what you **Eat**



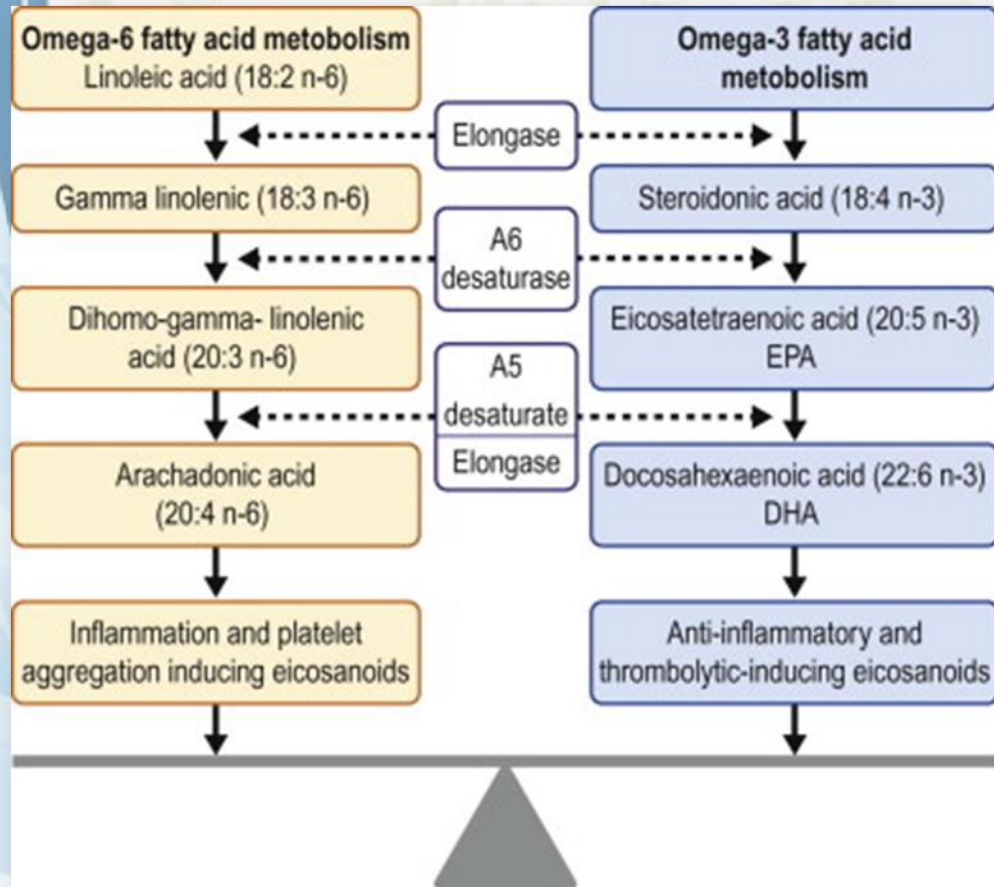
Food & Health



Anti inflammatory action



Anti inflammatory action

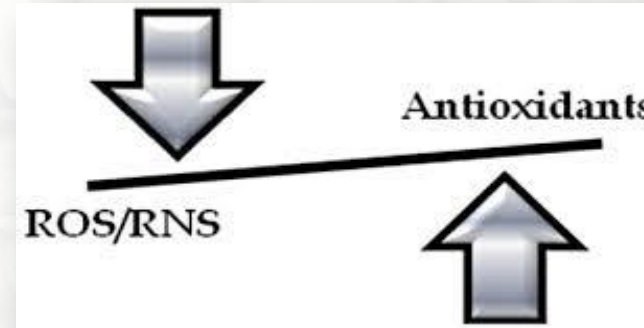


Dietary effects on inflammatory pathways

Cytokines and inflammatory markers in scleroderma	Effects on systemic sclerosis	Natural modulators
TGF- β	Principal factor in fibroblast activation, essential mediator of connective tissue remodeling during wound healing, tissue repair Implicated in pathological fibrosis	Modulated/inhibited by taurine, curcumin
PPAR- γ	Associated with Anti-inflammatory effects Endogenous antifibrotic, prevents excessive fibrotic responses Associated with regulation of matrix remodeling and fibrosis Abnormal function implicated in atherosclerosis, pulmonary hypertension Impaired expression or function may underlie uncontrolled progression of fibrosis	Upregulated by: curcumin
TNF- α	Dysregulation leads to rheumatoid arthritis, scleroderma, etc. Activation of vascular endothelium Increased locally and systemically in SS patients Rises with SS progression, development of fibrosing alveolitis, skin fibrous in Raynaud's syndrome	Inhibited by: garlic, mustard, celery seed, parsley, curcumin, ginger, horseradish, cinnamon, black and white pepper

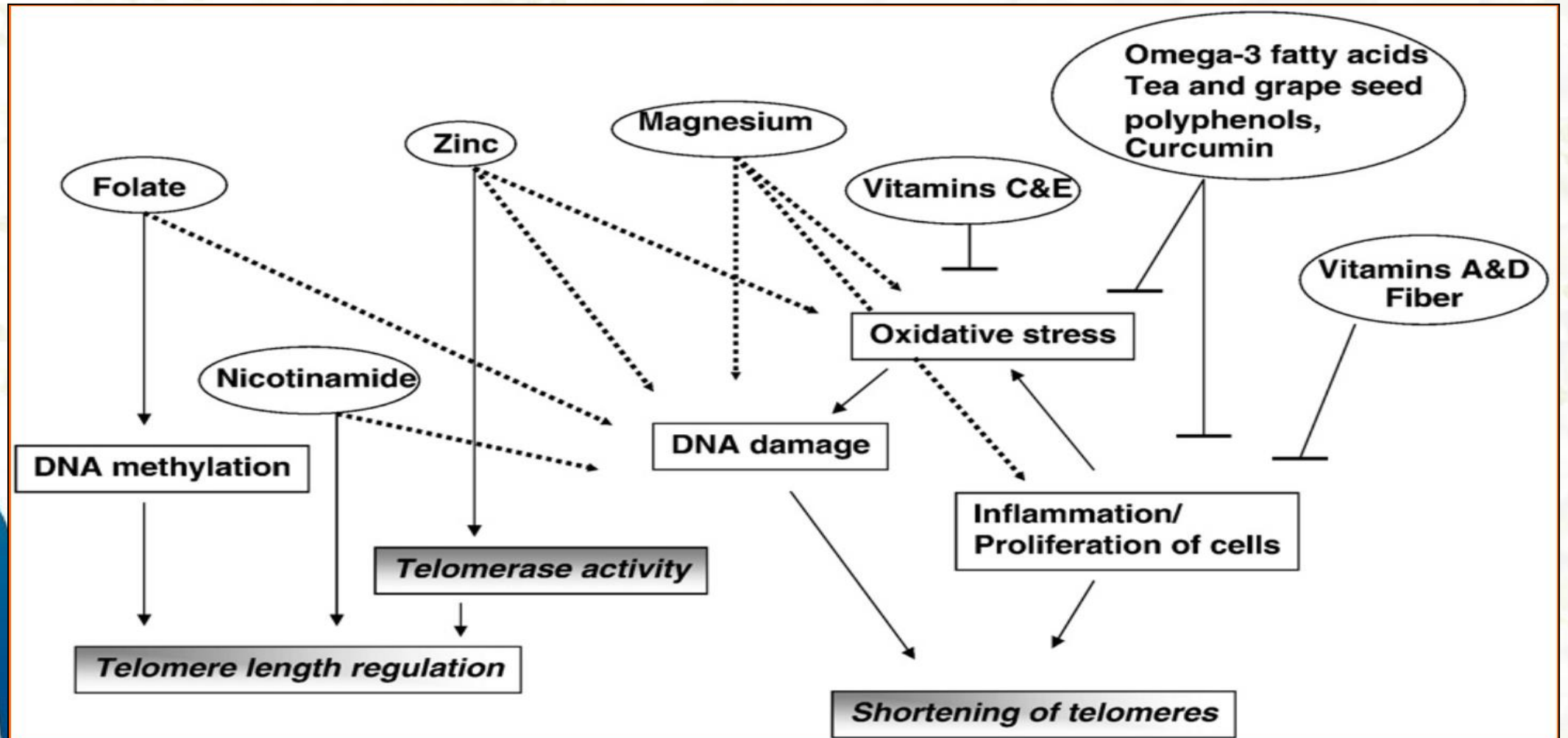
Dietary antioxidants effect on Oxidative stress

- **Directly** scavenging free radicals
- **Increasing** endogenous cellular **Antioxidant** defenses..
- **Prevent** the formation of **oxidized LDL**
- **Antagonize** fibrogenesis & fibrosis (inhibit NO)

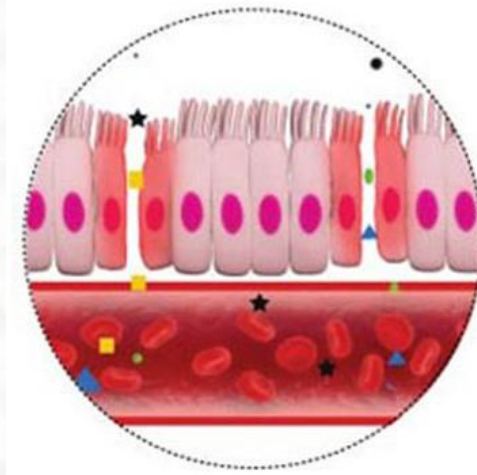


Nutrients of potential benefits

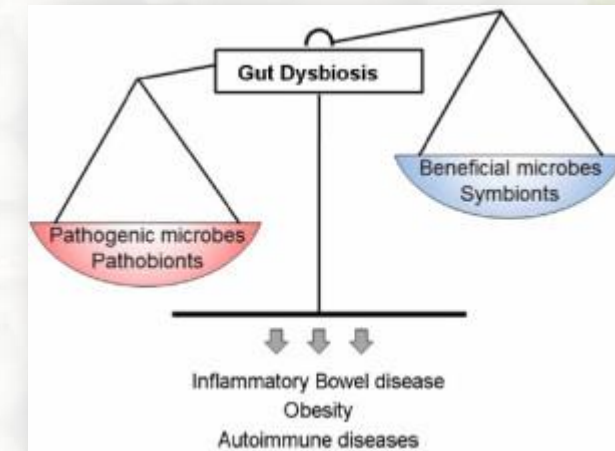
🍌 Potential influence of nutrients on telomeres



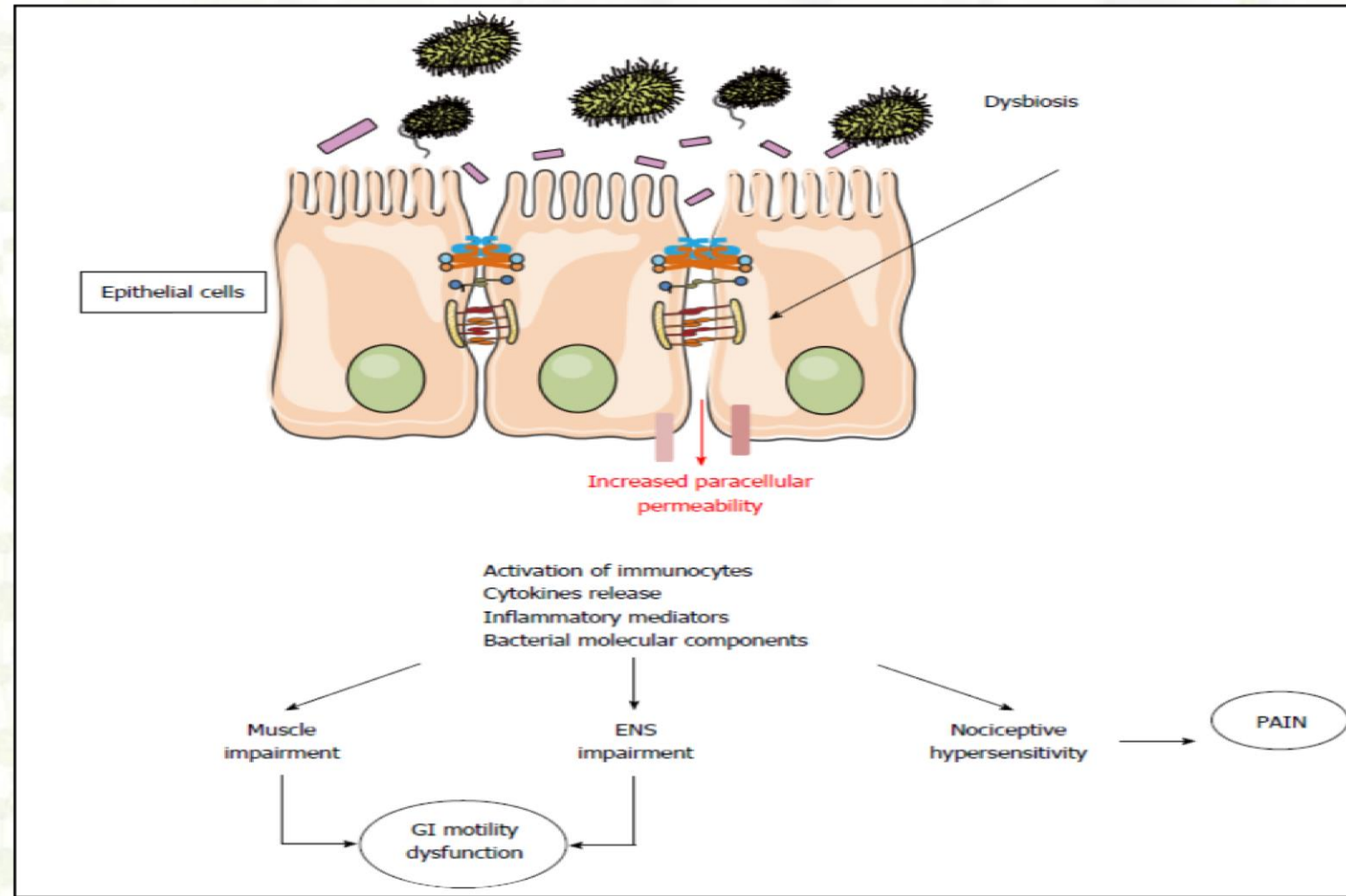
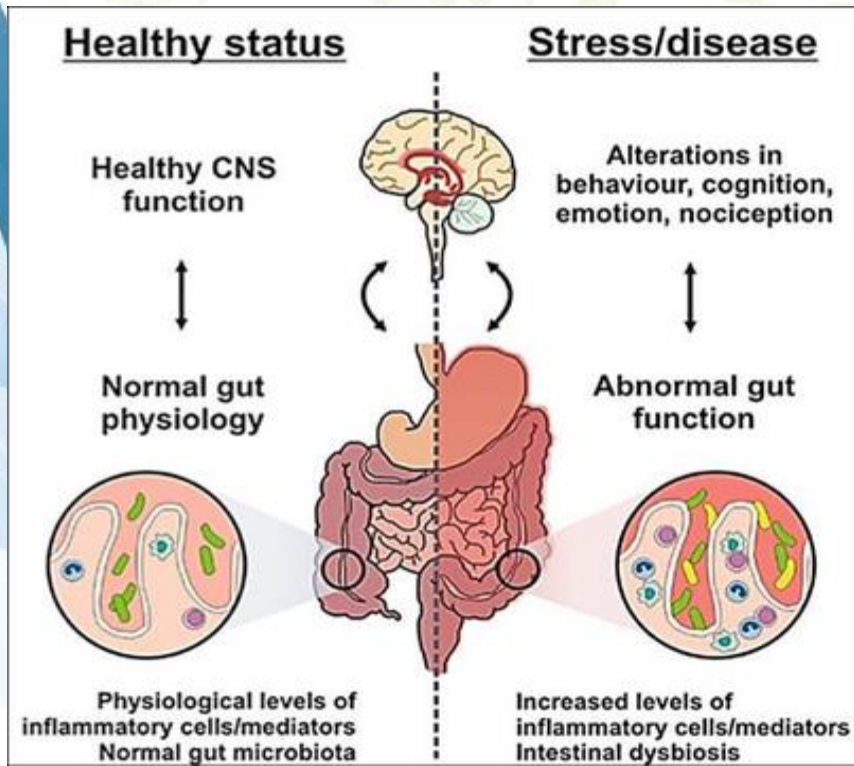
Probiotics & Prebiotics



- **Intestinal Dysbiosis** is common in SSc
- It is associated with GIT & extra-intestinal features
- Dysbiosis enables certain bacteria to cross the intestinal barrier, get into the bloodstream & trigger an inflammatory response which affect Gut NMJ



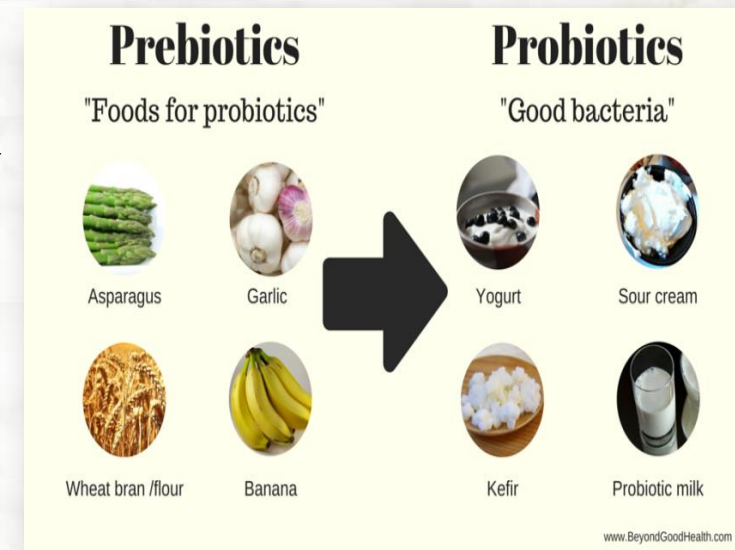
Microbiota can directly affect enteric nerves & smooth muscle cells functions through its metabolic products or bacterial molecular components translocated from the intestinal lumen



Probiotics & Prebiotics

 Modulate immune system & may restore the balance in cell types

- Inhibit DC activation
- Inhibit NF-KB & proinflammatory cytokines
- Augment Treg
- Antagonize the increased intestinal permeability
- Microflora fortification of barriers



General Nutrition Tips



- 🍎 Eat antioxidant-rich foods,
- 🍎 Avoid Refined foods & sugar.
- 🍎 Eat adequate healthy proteins
- 🍎 Use healthy oils
- 🍎 Eliminate trans-fatty acids (reduce to minimum)
- 🍎 Avoid smoking.
- 🍎 Hydrate well.
- 🍎 Exercise

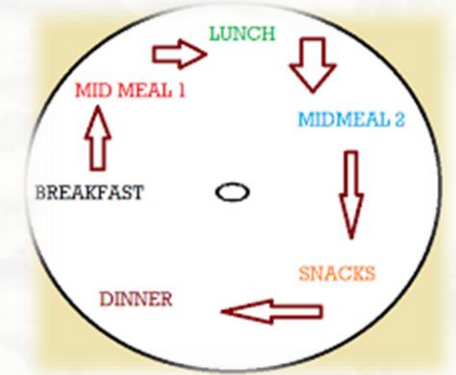
Special Problems Intervention

Dietary advice in writing should be **Individualized & Tailored** related to the **Problem(s)** in question



Nutrition Tips


- 🍎 Eat & chew slowly
- 🍎 Small frequent meals
- 🍎 Drink adequate water
- 🍎 Special conditions require Altered Food Texture
- 🍎 Alert to consumption of Dry food, Spicy food, Sticky food




Nutrition Tips



 People with SSc may not get enough vitamins & minerals in their diet, especially with GIT affection

 Omega-3 fatty acids

 Multi vitamins(antioxidant vitamins A, C, E, the B-complex vitamin s& trace minerals, e.g. Mg , Ca, Zn, Se.

 Bromelain.

 Turmeric



Undernutrition & Weight loss




- 🍌 Increase calories by **500–1000/d** through :
- 🍌 Increasing frequency of snacks
- 🍌 Layering calories by adding healthy oils & spreads
- 🍌 Preventing missed calories
- 🍌 Add liquid calories to meals & snacks
- 🍌 ONS

Swallowing Problems




- 
- 🍎 Eat & chew slowly
 - 🍎 Small frequent meals
 - 🍎 Stay well hydrated
 - 🍎 Consume food Slightly Cold
 - 🍎 **Drink fluid sips between food bites**
 - 🍎 **Soften food (e.g.: meat & vegetables)**
 - 🍎 **Moisten dry foods**
- 



Recommended foods

- 🍎 Milk & yogurt ,
 - 🍎 Puddings & custards
 - 🍎 Pureed vegetables,
 - 🍎 Omelets & scrambled eggs
 - 🍎 Fruit compote & Ice creams
- 

Foods to avoid

- 🍎 Sticky foods
 - 🍎 Dry Foods
 - 🍎 Food with small bones
 - 🍎 Hard Foods .
- 

Gastroesophageal Reflux

- 
- 
- 🍎 Eat & chew slowly
 - 🍎 Small frequent meals
 - 🍎 Stay well hydrated
 - 🍎 Eat soft consistency or pureed foods
 - 🍎 Avoid fat (butter, cream)
 - 🍎 Use simple cooking
 - 🍎 **Sit for 1–2 h after meals**
 - 🍎 **Elevate the head of bed & eat 2–3 hr before bedtime**

Foods to avoid

- 🍎 Alcohol
- 🍎 Carbonated beverages:
- 🍎 Chocolate & derivatives
- 🍎 Caffeine Wine, vinegar
- 🍎 Spices

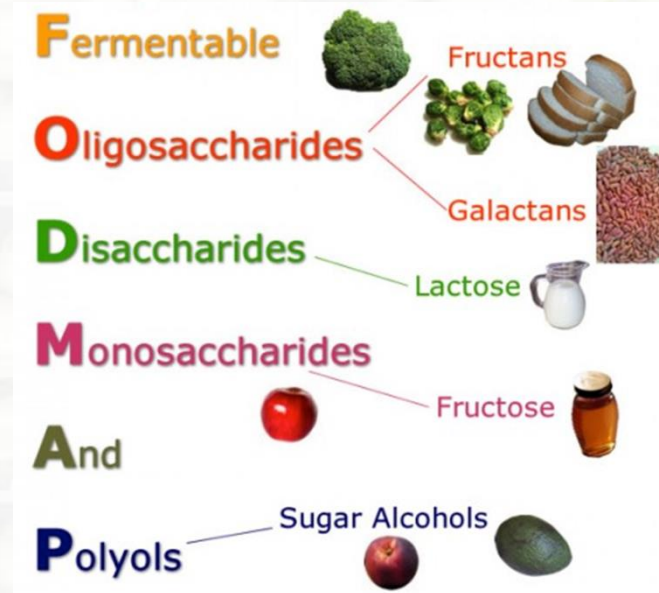
Foods to avoid

- 🍎 Citrus fruits
- 🍎 Garlic & onion

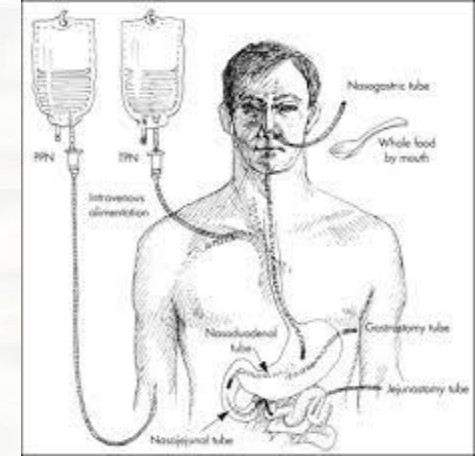
Bloating Gas & Constipation

Volume & carbohydrate modified:

- 🍎 Increase liquid meals and pureed options for gastroparesis
- 🍎 Low FODMAPS diet
- 🍎 Lactose- and sugar-modified oral supplements if calories are needed



EN / PN in SSc patients



- 🧊 Needed in cases when nutrition intake is diminished to an extent & duration that negatively alter health
- 🧊 In case the oral intake is insufficient with conventional foods, ONS are indicated
 - 🧊 EN in form of jejunostomy or PEG might be needed
 - 🧊 Severe cases of dysmotility & obstructions may require PN

Undesirable Interactions

ALERT

Nutraceuticals	Medication	Area of concern	Recommendation
Turmeric	blood thinners or NSAIDs.	Turmeric can increase the risk of bleeding, especially if added to Bromelain	Monitor
Vitamin C	(Iron tablets)	Increased effects/side effects due to enhanced iron absorption	Adjust Doses Monitor
	Antiarrhythmic (amiodarone)	May Increase light sensitivity of amiodarone	Monitor
Bromelain	Warfarin & Palvix	Increase risk of bleeding	Monitor

Undesirable Interactions

ALERT

Nutraceuticals	Medication	Area of concern	Recommendation
Ginger	Antacids	May decrease effectiveness	Monitor (L)
	Warfarin	Increase risk of spontaneous bleeding	# in doses >4gm dried & monitor in lower doses
	Nifedipine	May produce synergistic antiplatelet effect	# use
	NSAIDS	exacerbate the GIT risk	
Green tea	Folate	May decrease absorption	Need to increase folate dose*
	statins	May increase plasma level & side effects	Monitor
	Warfarin	May inhibit effect of drug	Monitor

Home Message



- **Screening of SSc patients helps early detection of Malnutrition**
- **Implementing NCP helps improve QoL**
- **Tailor nutrition Regimen to help improve General Condition**
- **Alerts to Undesirable Interactions**



**THANK
YOU**

